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A Guidelines Framework for Understandable BPMN Models

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Abstract

Business process modeling allows abstracting and reasoning on how work is structured within complex organizations. Business process models represent blueprints that can serve different purposes for a variety of stakeholders. For example, business analysts can use these models to better understand how the organization works; employees playing a role in the process can use them to learn the tasks that they are supposed to perform; software analysts/developers can refer to the models to understand the system-as-is before designing the system-to-be. Given the variety of stakeholders that need to interpret these models, and considering the pivotal function that models play within organizations, *understandability* becomes a fundamental quality that need to be taken into particular account by modelers. In this paper we provide a set of fifty guidelines that can help modelers to improve the understandability of their models. The work focuses on the Business Process Modelling Notation 2.0 standard published by the Object Management Group, which has acquired a clear predominance among the modeling notations for business processes. Guidelines were derived by means of a thoughtful literature review – which allowed identifying around one hundred guidelines – and through successive activities of synthesis and homogenization. In addition, we implemented a freely available open source tool, named BEBoP (understandaBility vErifier for Business Process models), to check the adherence of a model to the guidelines. Finally, guidelines violation has been checked with BEBoP on a dataset of 11,294 models available in a publicly accessible repository. Our tests show that, although the majority of the guidelines are respected by the models, some guidelines, which are recognized as fundamental by the literature, are frequently violated.

Keywords— Models Understandability; Business Process Modeling; BPMN; Modeling Guidelines; Model Quality; Tool.

1 Introduction

Graphical notations are often used to enhance textual or verbal communication, providing stakeholders with the possibility to actually *see* the subject of the discussion. This is particularly true within complex organizations, in which graphical notations can be used to represent Business Processes (BP) and hence visualize and reason about work practices. A BP consists of "activities that take one or more kinds of inputs creating an output, and that are performed in coordination in an organizational and technical environment" [Weske, 2012]. In addition, Business Process Management (BPM) supports stakeholders by providing methods, techniques and software to model, implement, execute and optimize work practices [Jeston and Nelis, 2014].

The literature shows that BP modeling has been identified as an important phase in BPM [Kalpic and Bernus, 2002], and the benefits of its use in practice are well recognized [Indulska et al, 2009]. At the same time the quality of the models resulting from the modeling phase is critical for the success of an organizations [Moreno de Oca et al, 2015]. In particular, the designed models must fit with the reality, and they must be considered *understandable* by all the stakeholders interested in the information they convey.

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